

# **Electrocatalytic oxidation and flow-injection determination of sulfur amino acids on a glassy carbon electrode modified by a nickel(II) polytetrasulfophthalocyanine film**

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## **Abstract**

The electrochemical oxidation of sulfur amino acids, i.e., cysteine, cystine, and methionine, is studied on a glassy carbon electrode modified by a film of nickel(II) polytetrasulfophthalocyanine (poly-NiTsPc). Poly-NiTsPc demonstrates a selective mediator activity in the oxidation of sulfur amino acids, depending on the pH of solution. The proper conditions for fabricating a polymer film on the surface of glassy carbon are found and the conditions of registering the maximal electrocatalytic effect on the modified electrode are determined. A procedure is proposed for the voltammetric determination and amperometric detection of cysteine, cystine, and methionine on an electrode coated by a poly-NiTsPc film under the conditions of flow-injection analysis (FIA). The linear relation of the electrocatalytic response of a composite electrode to amino acid concentration is observed to the level  $n \times 10^{-6}$  M in the static mode and  $n \times 10^{-9}$  M under FIA conditions. © 2013 Pleiades Publishing, Ltd.

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## **Keywords**

chemically modified electrodes, electrocatalysis, electrooxidation of sulfur amino acids, flow-injection analysis, nickel(II) phthalocyanine, polymer films